Nome River Salmon Counting Weir
Project Summary Report, 1999

by

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Abstract

The Alaska Department of Fish and Game operated a counting tower on the Nome River approximately three miles east of Nome from 1993 until 1995. In 1996 the counting tower was replaced by a weir which was operated for the fourth year in 1999. The objectives of the project are to obtain daily and seasonal estimates of the timing and magnitude of the salmon and Dolly Varden escapement by species to the Nome River. The Nome River tower camp is approximately 3 miles upstream from the mouth of the river, on land leased to the Alaska Department of Fish & Game (ADF&G) by the Sitnasuak Native Corporation. The crew began working on 28 June, 1999. After inventorying equipment and purchasing supplies, they ferried equipment to the project site by truck and jet boat. A full weir was built to completely block the river to fish passage. A gate was installed in the weir to allow fish passage and enumeration. Counting began on 2 July and continued through 25 August. The total cumulative weir counts were: 1,048 chum salmon, 2,033 pink salmon, 3 king salmon, 417 coho salmon, 6 sockeye salmon, and 236 Dolly Varden. This was the seventh consecutive year of operation for an escapement project on the Nome River. The escapement for chum salmon in 1999 was both the latest and weakest since the project began. The odd year pink salmon escapement in 1999 was also the latest and weakest on record and only a small fraction of any even year escapement. King salmon escapement in 1999 was the second lowest since 1993. Coho salmon escapement in 1999 was also the second lowest. The count of Dolly Varden is minimal as the crew reported only counting them about half of the days.

INTRODUCTION

The Nome River drains into Norton Sound approximately three miles east of Nome. Commercial fishing has been progressively reduced through regulatory restrictions since the late 1970s and the marine waters near the mouth were closed in 1984. The Nome River currently supports a large number of subsistence and sport users, however, their fishing opportunities generally continue to decrease as low numbers of salmon return to the river most years. The subsistence and sport fisheries are now managed at a level of intensity similar to a commercial fishery, with Emergency Orders regulating restrictions and fishing periods.

A salmon counting tower was operated on the Nome River starting in 1993 (Bue 1994, Rob 1995a and 1995b). A weir replaced the counting tower beginning in 1996. The 1999 season was the fourth year of weir operation (Rob 1997, 1998 and 1999). The returns of chum, pink, king, and coho salmon and of Dolly Varden were counted. The project operates as a means to obtain timely and accurate escapement information that is required to actively manage the stocks throughout the season.

OBJECTIVES

1. Obtain daily and seasonal estimates of the timing and magnitude of the salmon escapement by species to the Nome River.

2. Obtain daily and seasonal estimates of the timing and magnitude of the Dolly Varden escapement to the Nome River.

METHODS

The Nome River tower camp is approximately 3 miles upstream from the mouth of the river, on land leased to the Alaska Department of Fish & Game (ADF&G) by the Sitnasuak Native Corporation (Figure 1). In 1997 the project site was moved approximately ½ mile downstream from the previous counting tower site. The new site is wider, shallower and better suited for weir operations.

The crew began working on 28 June, 1999. After inventorying equipment and purchasing supplies, they ferried equipment to the project site by truck and jet boat. The camp was then established. A full weir was built to completely block the river to fish passage. A gate was installed in the weir to allow fish passage and enumeration. The weir was made of a series of 1¼" pipes assembled in pairs using locking metal brackets. Aluminum stringers twelve feet long connected the pairs of pipes horizontally. Metal conduit pipes ten feet long were inserted vertically in holes 1¾ inches on center on the stringers. This

formed a weir designed to be easily cleaned, fish tight and easily removed in the event of a flash flood.

Dolly Varden were reported to being counted only on approximately half of the days of operation.

The crew traveled to Nome for their days off and also to pick up groceries, supplies and mail. Nome office staff transported the crew to and from the Nome River highway bridge and provided other logistical support (Rob 1999).

RESULTS

Table 1 shows the daily and cumulative weir passage for each species.

The total cumulative weir counts were: 1,048 chum salmon, 2,033 pink salmon, 3 king salmon, 417 coho salmon, 6 sockeye salmon, and 236 Dolly Varden (Table 1). Figures 2-11 show graphs of the daily and cumulative totals for each species counted.

Counting began on 2 July. Dolly Varden were first observed on 4 July, chum salmon were first observed on 5 July, king salmon were first observed on 11 July, and coho salmon were first observed on 30 July (Table 1). The daily peak of 127 chum salmon occurred on 7 August, the daily peak of 172 pink salmon occurred on 7 August, the daily peak of 175 coho salmon occurred on 19 August, and the daily peak of 43 Dolly Varden occurred on 22 August (Table 1). Most chum salmon returned during the three week period from 18 July through 8 August when 71% passed the weir (Table 1 and Figures 2 and 3). Most pink salmon returned during the three week period from 30 July through 20 August when 80% passed the weir (Table 1 and Figures 4 and 5). Only three king salmon returned on 11 July, 8 August, and 16 August (Table 1). Most coho salmon returned during the last week of weir operation when 82% passed the weir (Table 1 and Figures 6 and 7). Dolly Varden returned between 4 July and 25 August(Table 1 and Figures 8 and 9).

A peak aerial survey count of 375 chum salmon was made on 23 July, 1999. The total season weir count of chum salmon was 1,048 (Table 1). The peak aerial survey counted 36% of the total season weir count of chum salmon. The peak aerial survey counted 245 chum salmon above the weir on 23 July, when the cumulative weir count of chum salmon was 400 (Table 1). The peak aerial survey counted 61% of the cumulative weir count on 23 July.

A peak aerial survey count of 345 pink salmon was made on 23 August, 1999. The total season weir count of pink salmon was 2,033 (Table 1). The peak aerial survey counted 17% of the total season weir count of pink salmon. The peak aerial survey counted 345 pink salmon above the weir on 23 August, when the cumulative weir count of pink

salmon was 1,979 (Table 1). The peak aerial survey counted 17% of the cumulative weir count on 23 August.

Climatological and stream observations are shown in Table 2.

DISCUSSION

This was the seventh consecutive year of operation for an escapement project on the Nome River. During the first four years the project site was approximately ½ mile upstream of the current site at a location better suited to operation of a counting tower. River conditions this year were generally good until 25 August when the counting season ended.

Thirty feet of the weir washed out in the shallowest part of the river on 25 July for 15.5 hours and possibly fish were missed.

The count of Dolly Varden is minimal as the crew reported only counting them about half of the days.

The Nome River counting tower operated from 25 July to 28 August in 1993, from 24 June to 15 August in 1994, and from 22 June to 6 September in 1995. The Nome River weir operated from 26 June to 23 July in 1996, from 27 June to 27 August in 1997, from 1 July to 11 August in 1998, and from 2 July to 25 August in 1999. The escapement for chum salmon in 1999 was both the latest and weakest since the project began (Figure 10). The odd year pink salmon escapement in 1999 was also the latest and weakest on record and only a small fraction of any even year escapement (Figures 11 and 12). King salmon escapement in 1999 was the second lowest since 1993 (Figure 13). Coho salmon escapement in 1999 was also the second lowest (Figure 14). The incomplete counts of Dolly Varden escapement in 1999 are shown in Figure 15 for comparison with previous years

ACKNOWLEDGEMENTS

The Norton Sound Economic Development Corporation (NSEDC) provided and funded a college intern to be a member of the crew. The crew leader for the season was Cameron Lingle. Vaughn Munn, the NSEDC intern was the second crewmember. Paul Thornson and Gary Knuepfer assisted in removing the weir. A draft of this report was reviewed by Larry Buklis.

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Table 1. Daily passage of all salmonid species at the Nome River weir, Norton Sound, 1999.

	Daily chum salmon	Cumulative chum salmon	Daily pink salmon	Cumulative pink salmon	Daily king salmon	Cumulative king salmon	Daily coho salmon	Cumulative coho salmon	Daily Dolly Varden[a]	Cumulative Dolly Varden[a]	Other
2-Jul	0	0	0	0	0	0	0	0	0	0	
3-Jul	0	0	0	0	0	0	0	0	0	0	
4-Jul	0	0	0	0	0	0	0	0	3	3	
5-Jul	1	1	0	0	0	0	0	0	10	13	
6-Jul	0	1	0	0	0	0	0	0	3	16	
7-Jul	0	1	0	0	0	0	0	0	0	16	
8-Jul	0	1	0	0	0	0	0	0	0	16	
9-Jul	18	19	0	0	0	0	0	0	0	16	
10-Jul	25	44	1	1	0	0	0	0	15	31	
11-Jul	8	52	0	1	1	1	0	0	0	31	
12-Jul	7	59	0	1	0	1	0	0	0	31	
13-Jul	5	64	0	1	0	1	0	0	0	31	
14-Jul	11	75	0	1	0	1	0	0	0	31	
15-Jul	49	124	18	19	0	1	0	0	0	31	
16-Jul	17	141	3	22	0	1	0	0	0	31	
17-Jul	2	143	4	26	0	1	0	0	0	31	
18-Jul	98	241	11	37	0	1	0	0	0	31	
19-Jul	13	254	0	37	0	1	0	0	0	31	
20-Jul	32	286	0	37	0	1	0	0	0	31	
21-Jul	101	387	10	47	0	1	0	0	6	37	
22-Jul	1	388	0	47	0	1	0	0	0	37	
23-Jul	12	400	7	54	0	1	0	0	0	37	
24-Jul	0	400	0	54	0	1	0	0	0	37	
25-Jul	0	400	0	54	0	1	0	0	0	37	
26-Jul	1	401	1	55	0	1	0	0	0	37	
27-Jul	34	435	37	92	0	1	0	0	0	37	
28-Jul	7	442	10	102	0	1	0	0	2	39	
29-Jul	42	484	20	122	0	1	0	0	0	39	
30-Jul	29	513	74	196	0	1	1	1	10	49	
31-Jul	65	578	50	246	0	1	0	1	8	57	
1-Aug	5	583	24	270	0	1	0	1	0	57	
2-Aug	15	598	115	385	0	1	1	2	4	61	4 sockeye
3-Aug	55	653	135	520	0	1	0	2	0	61	
4-Aug	28	681	176	696	0	1	6	8	3	64	1 sockeye
5-Aug	16	697	60	756	0	1	4	12	0	64	
6-Aug	59	756	135	891	0	1	0	12	21	85	
7-Aug	127	883	172	1,063	0	1	5	17	0	85	
8-Aug	41	924	164	1,227	1	2	4	21	14	99	
9-Aug	14	938	27	1,254	0	2	0	21	0	99	
10-Aug	19	957	53	1,307	0	2	8	29	0	99	
11-Aug	12	969	53	1,360	0	2	4	33	2	101	1 sockeye
12-Aug	7	976	40	1,400	0	2	1	34	0	101	
13-Aug	2	978	7	1,407	0	2	5	39	2	103	
14-Aug	1	979	4	1,411	0	2	0	39	0	103	
15-Aug	7	986	85	1,496	0	2	7	46	5	108	
16-Aug	5	991	16	1,512	1	3	6	52	0	108	
17-Aug	6	997	34	1,546	0	3	6	58	23	131	
18-Aug	9	1,006	45	1,591	0	3	17	75	0	131	
19-Aug	9	1,015	151	1,742	0	3	175	250	9	140	
20-Aug	2	1,017	10	1,752	0	3	9	259	0	140	
21-Aug	11	1,028	115	1,867	0	3	34	293	22	162	
22-Aug	11	1,039	71	1,938	0	3	38	331	43	205	
23-Aug	1	1,040	41	1,979	0	3	21	352	0	205	
24-Aug	3	1,043	29	2,008	0	3	7	359	8	213	
25-Aug	5	1,048	25	2,033	0	3	58	417	23	236	

[a] Dolly Varden were reportedly counted only on approximately half of the days of operation

Table 2. Climatological observations at the Nome River weir, Norton Sound, 1999.

Date	Water Temp °C	Water Guage (cm)
2-Jul		
3-Jul		
4-Jul	13.0	
5-Jul	13.0	
6-Jul	10.0	44.0
7-Jul	8.5	43.0
8-Jul	8.5	43.0
9-Jul	9.0	41.0
10-Jul	13.0	40.0
11-Jul	14.5	40.0
12-Jul	12.5	39.0
13-Jul	15.0	37.5
14-Jul	13.0	39.0
15-Jul	12.0	39.5
16-Jul	12.0	38.0
17-Jul	9.5	37.5
18-Jul	9.5	38.5
19-Jul	9.0	44.0
20-Jul	8.0	57.0
21-Jul	9.0	46.0
22-Jul	11.0	42.5
23-Jul	9.5	41.0
24-Jul	10.5	49.0
25-Jul	9.5	64.0
26-Jul	9.0	57.0
27-Jul	11.0	50.0
28-Jul	12.0	48.5
29-Jul		
30-Jul	9.0	63.0
31-Jul	8.5	90.0
1-Aug	8.0	77.5
2-Aug	7.5	73.5
3-Aug	11.0	68.0
4-Aug	11.0	71.0
5-Aug	10.5	74.5
6-Aug	9.5	65.0
7-Aug	9.0	64.0
8-Aug	10.0	61.5
9-Aug	11.0	60.0
10-Aug	8.5	76.0
11-Aug	8.5	71.5
12-Aug	10.0	67.5
13-Aug	9.5	65.0

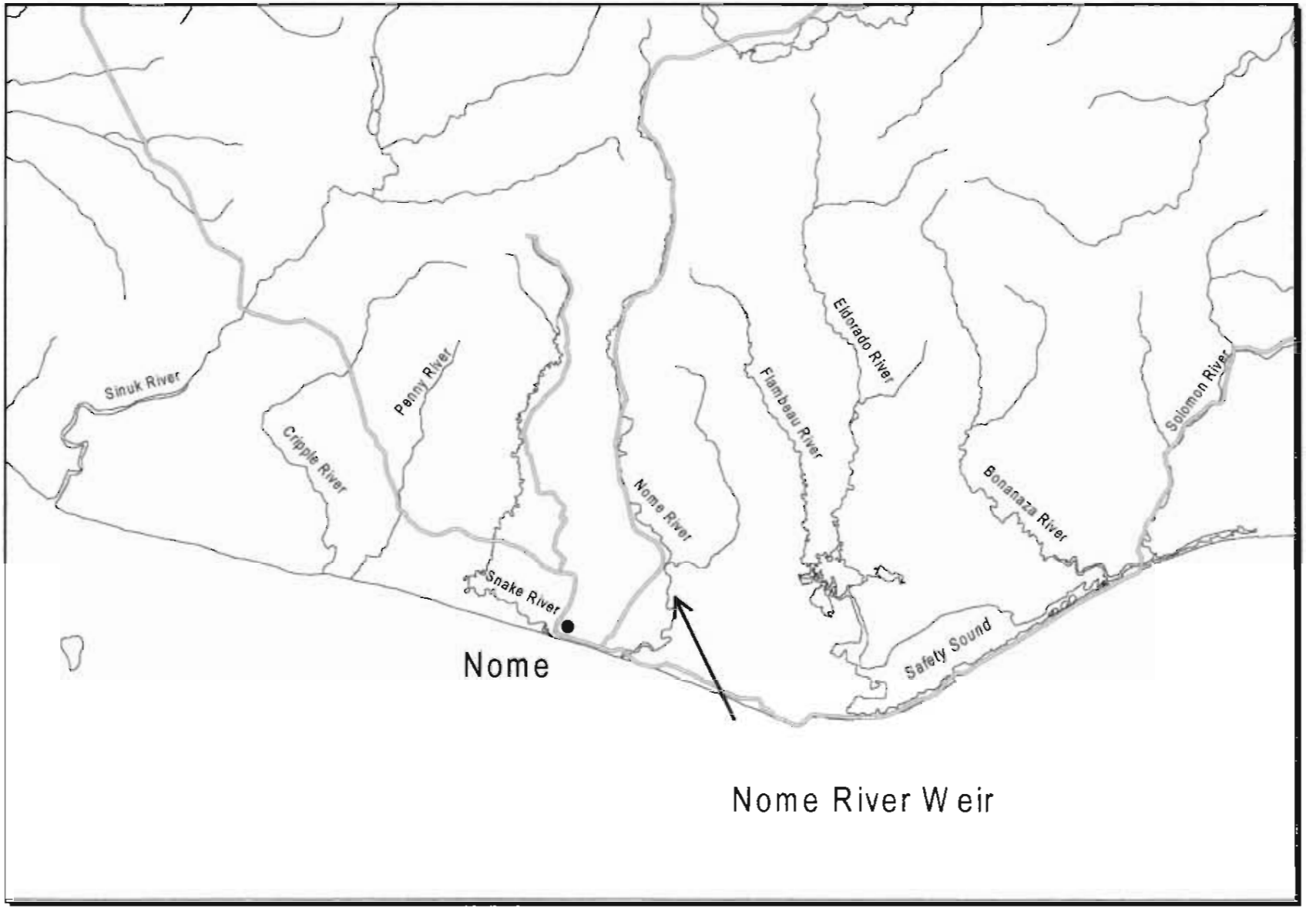

Figure 1. Area location map of the Nome River weir project site, Norton Sound, 1999.

Figure 2. Daily chum salmon migration past the Nome River weir, Norton Sound, 1999.

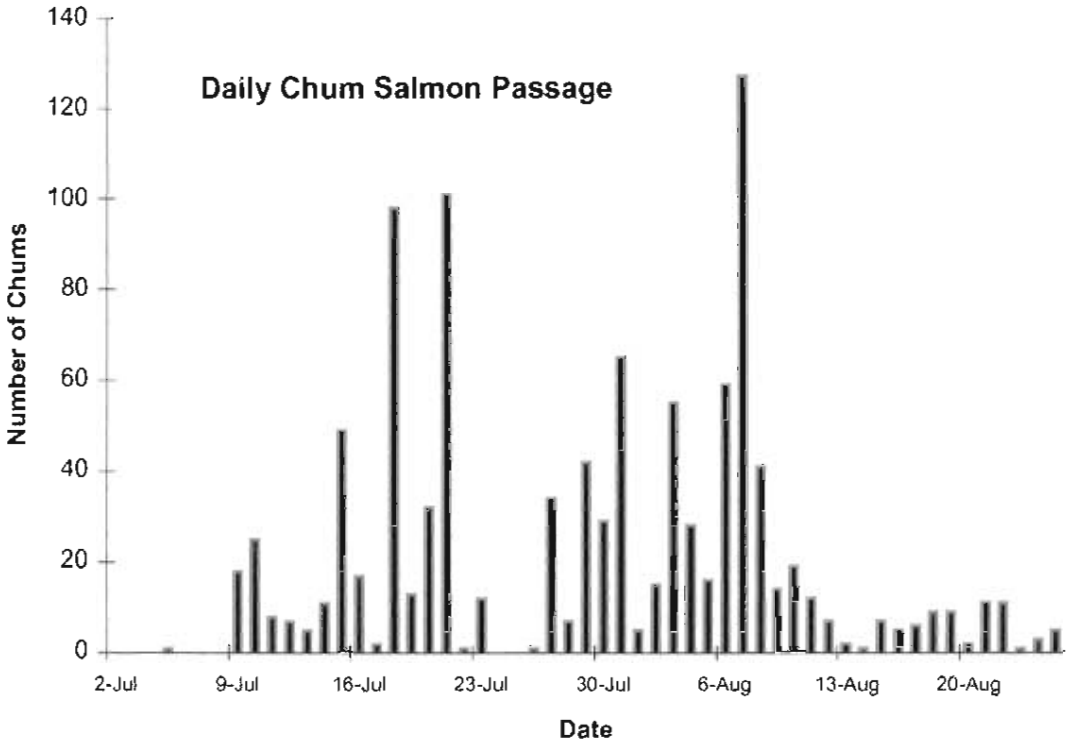

Figure 3. Cumulative chum salmon migration past the Nome River weir, Norton Sound 1999.

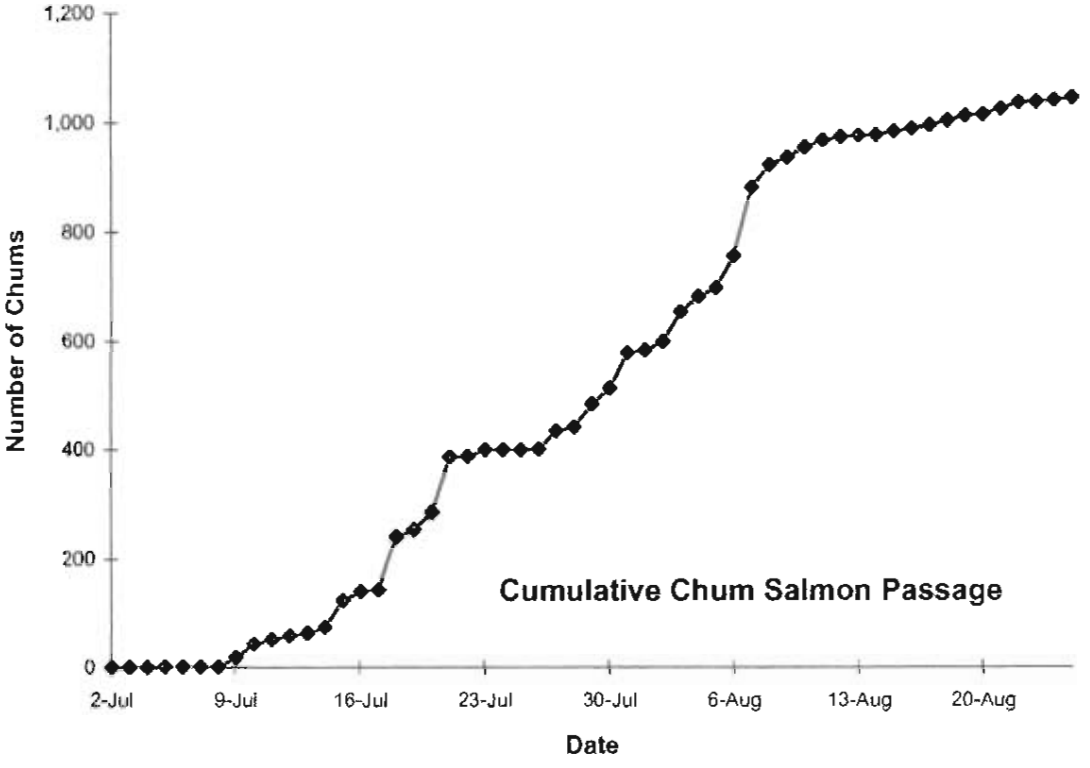

Figure 4. Daily pink salmon migration past the Nome River weir, Norton Sound, 1999.

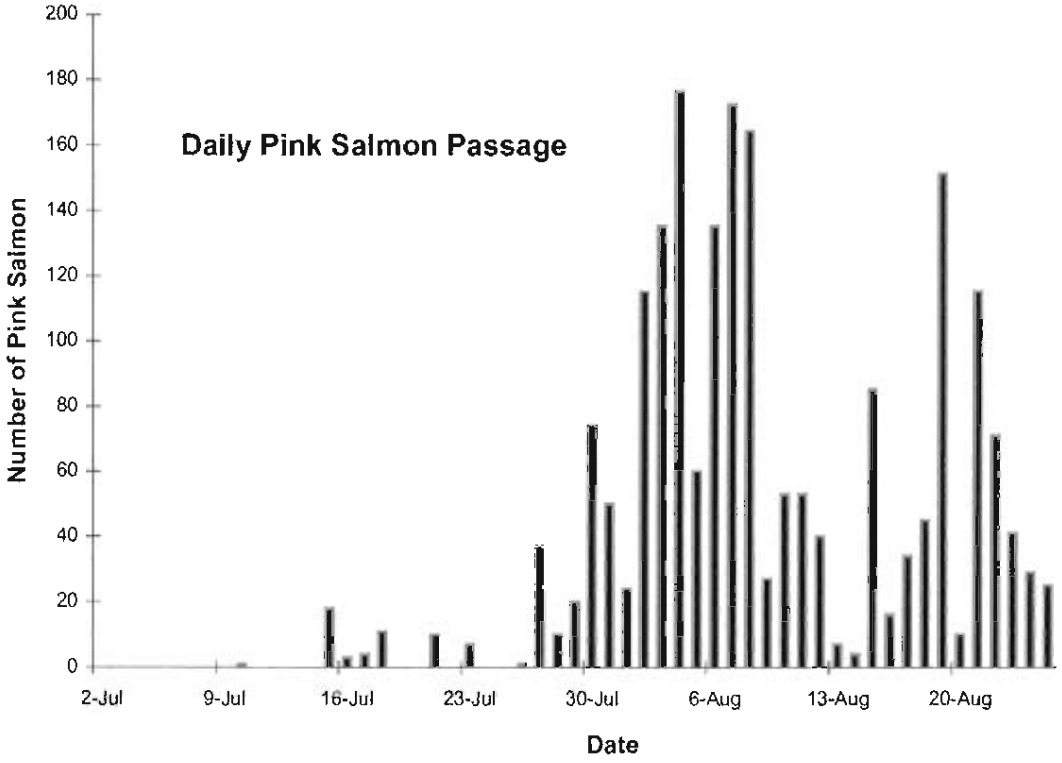

Figure 5. Cumulative pink salmon migration past the Nome River weir, Norton Sound, 1999.

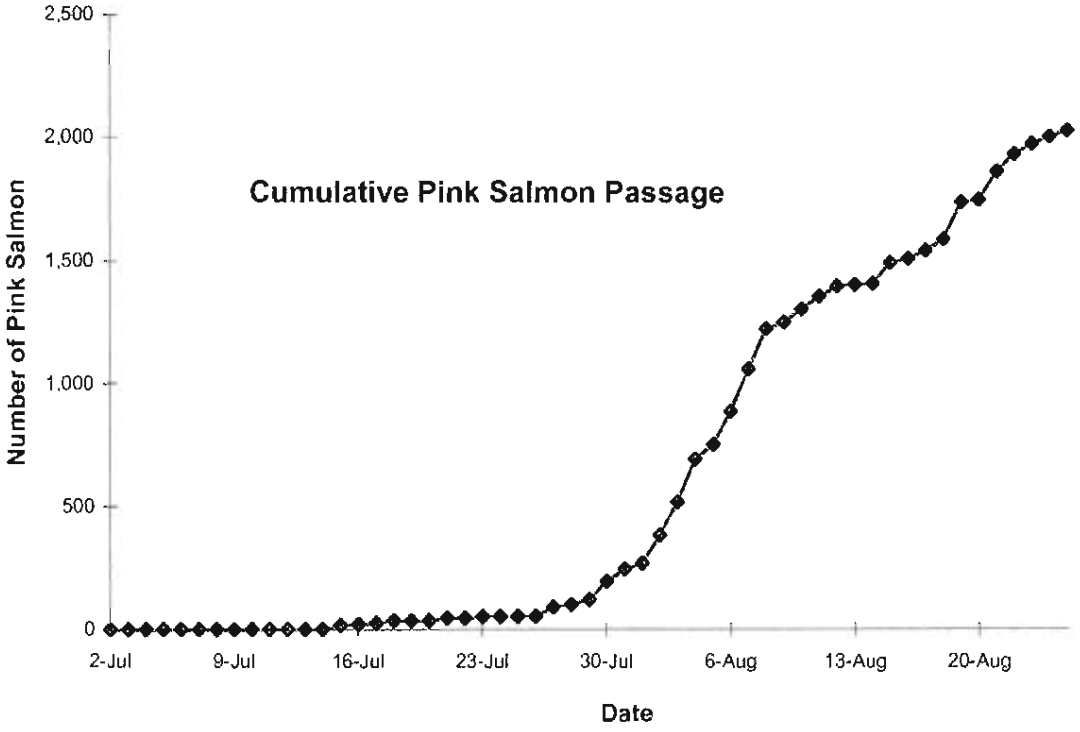

Figure 6. Daily coho salmon migration past the Nome River weir, Norton Sound, 1999.

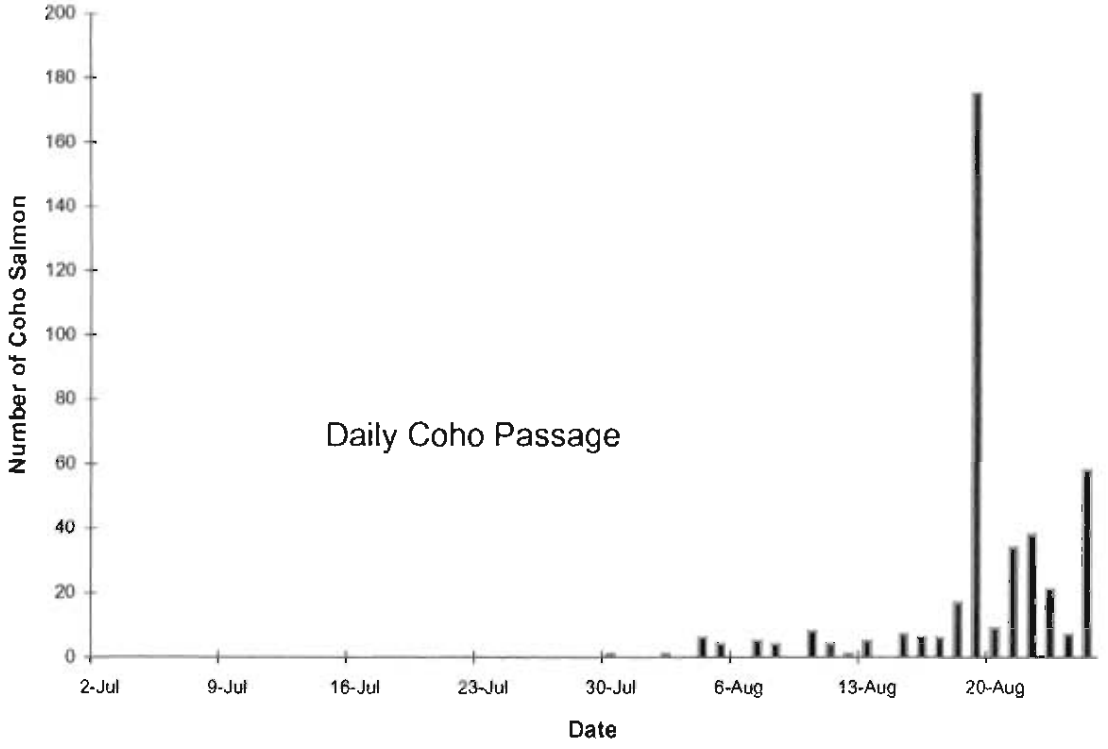

Figure 7. Cumulative coho salmon migration past the Nome River weir, Norton Sound, 1999.

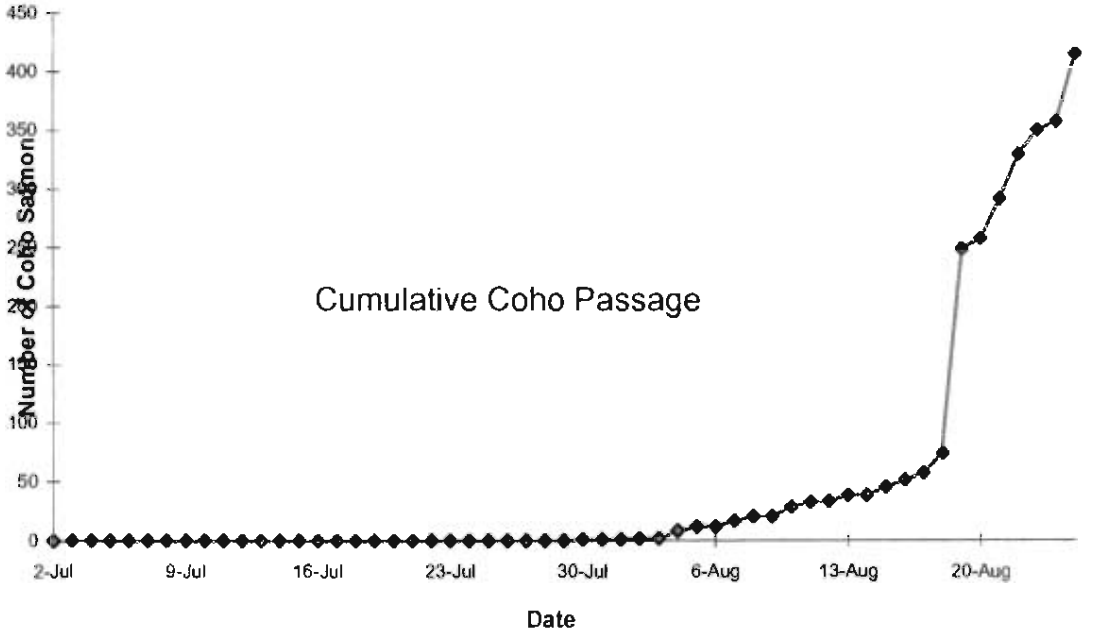

Figure 8. Daily Dolly Varden migration past the Nome River weir, Norton Sound, 1999.

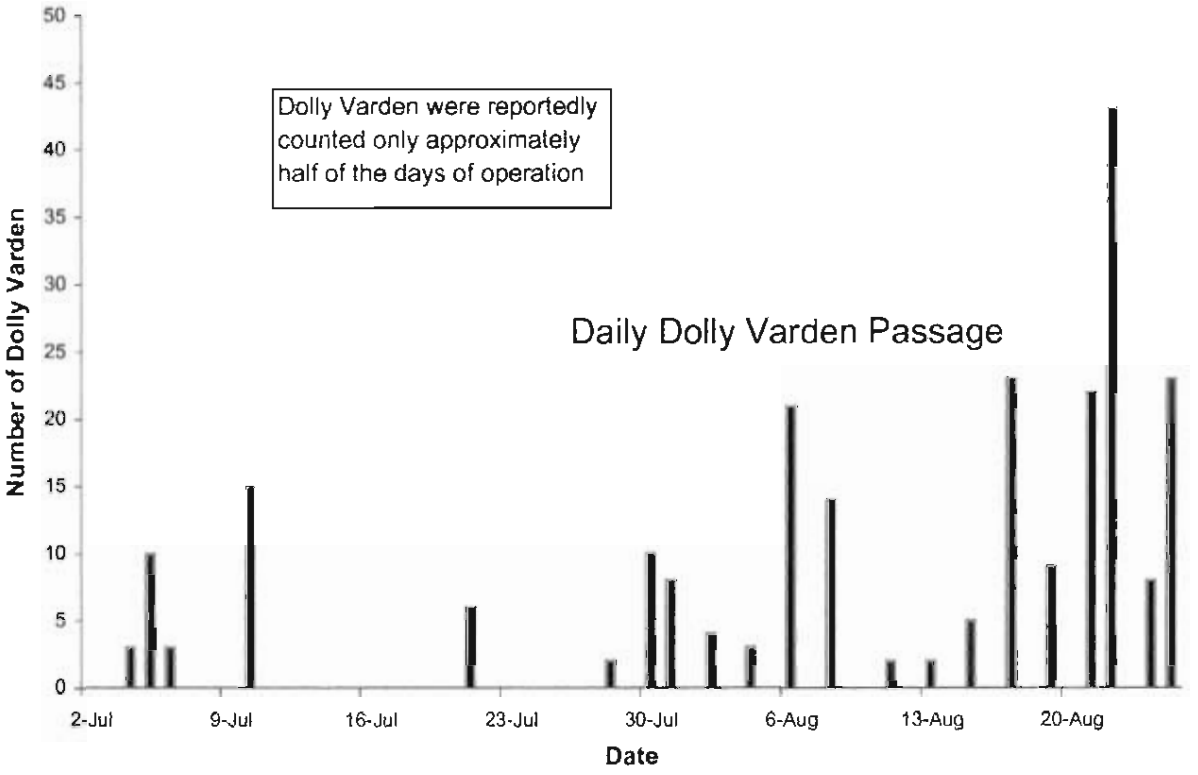

Figure 9. Cumulative Dolly Varden migration past the Nome River weir, Norton Sound, 1999.

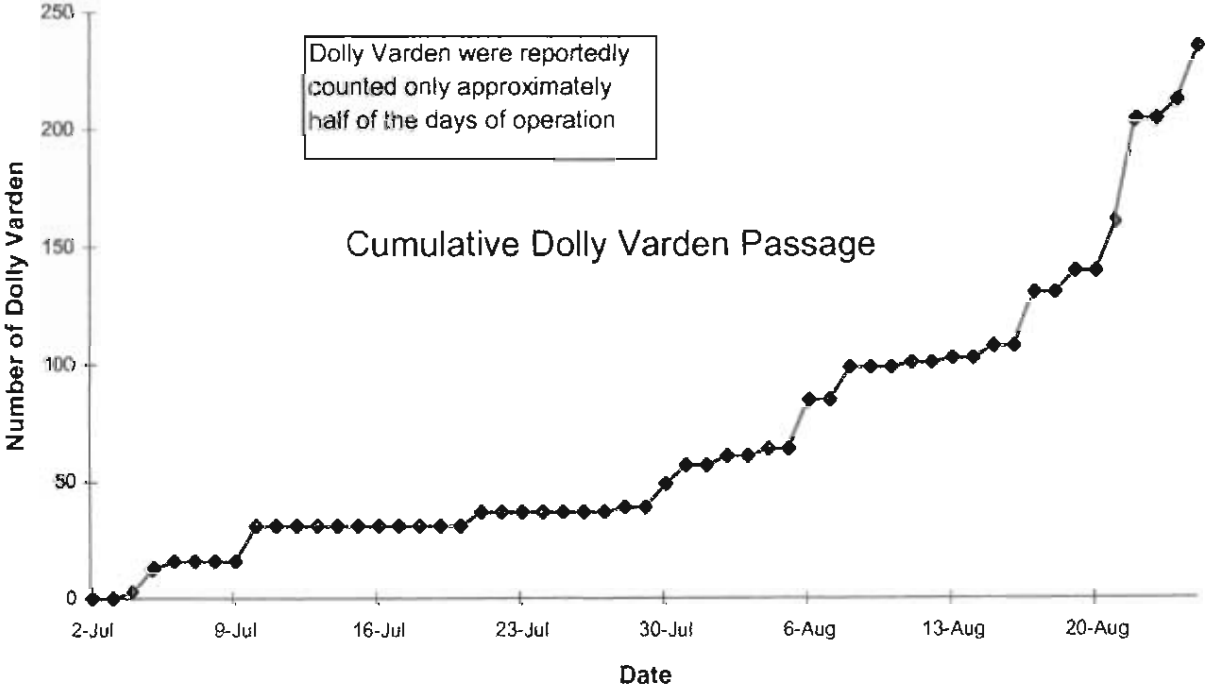

Figure 10. Cumulative passage of chum salmon past the Nome River counting tower, 1993-1995, and the Nome River weir, 1996-1999, Norton Sound.

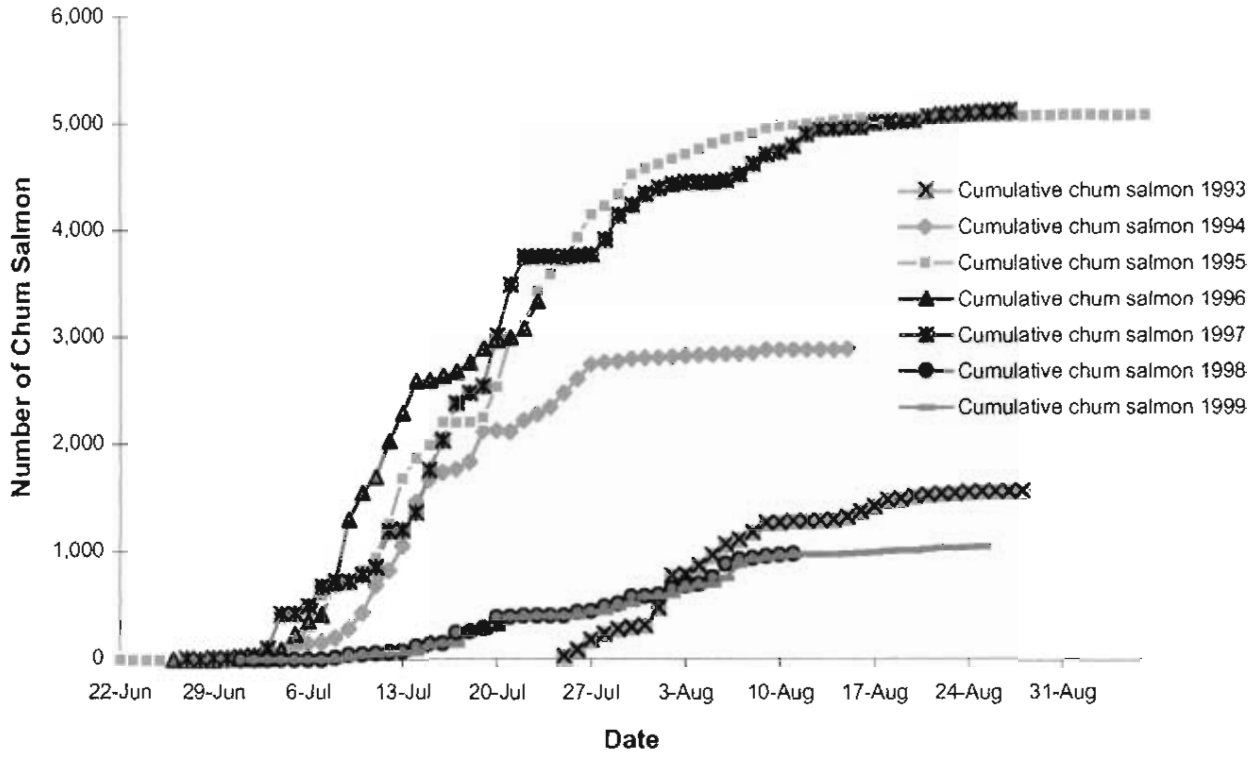

Figure 11. Cumulative odd year pink salmon migration past the Nome River counting tower, 1993-1995, and the Nome River weir, 1997-1999, Norton Sound.

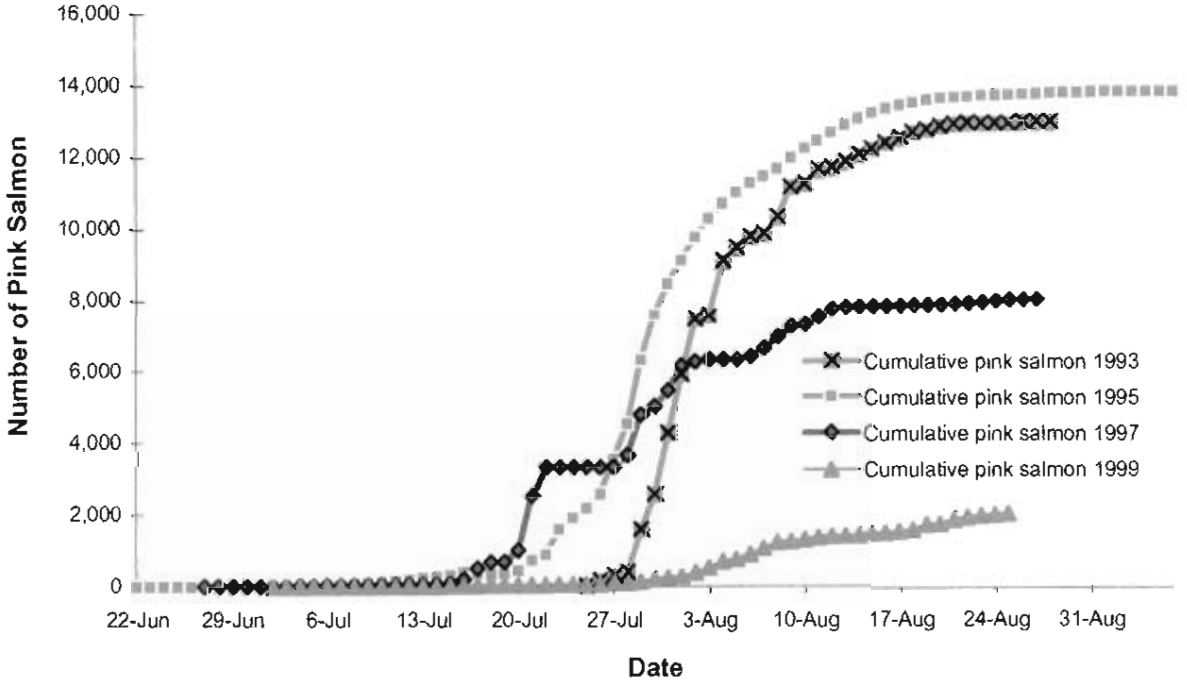

Figure 12. Cumulative even year pink salmon migration past the Nome River counting tower, 1994, and the Nome River weir, 1996 and 1998, Norton Sound.

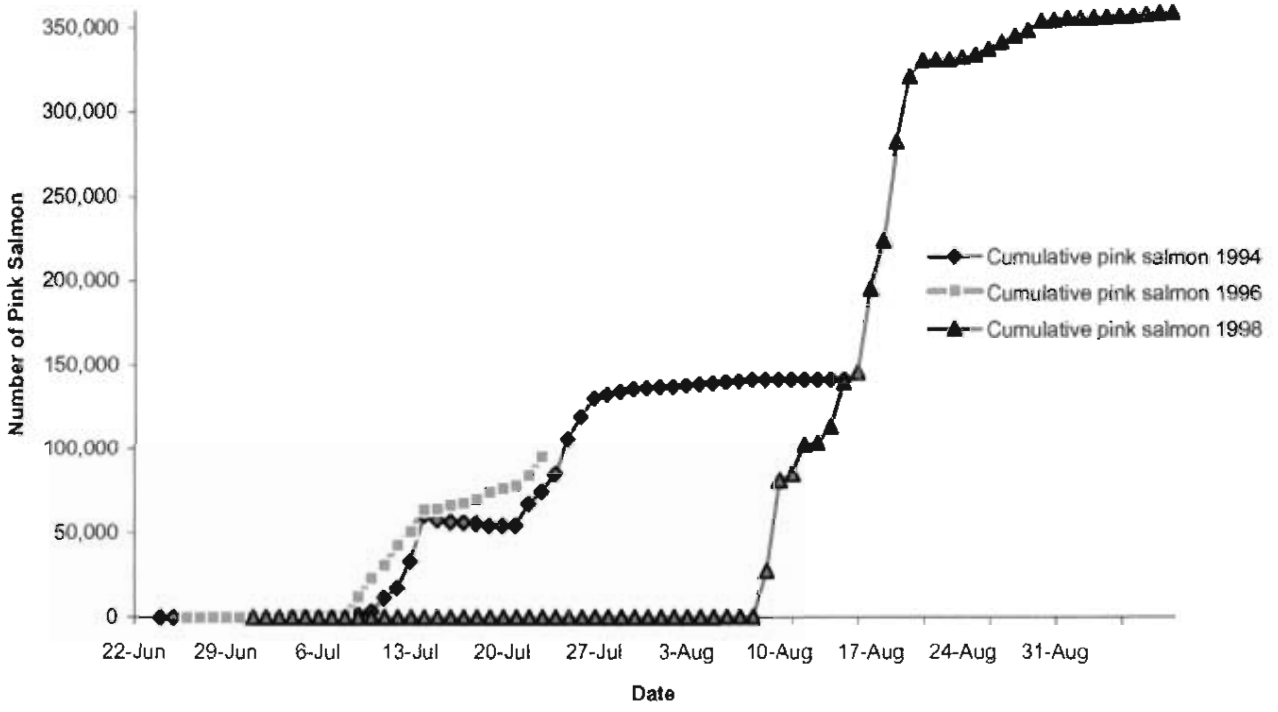

Figure 13. Cumulative king salmon migration past the Nome River counting tower, 1993-1995, and the Nome River weir, 1996-1999, Norton Sound.

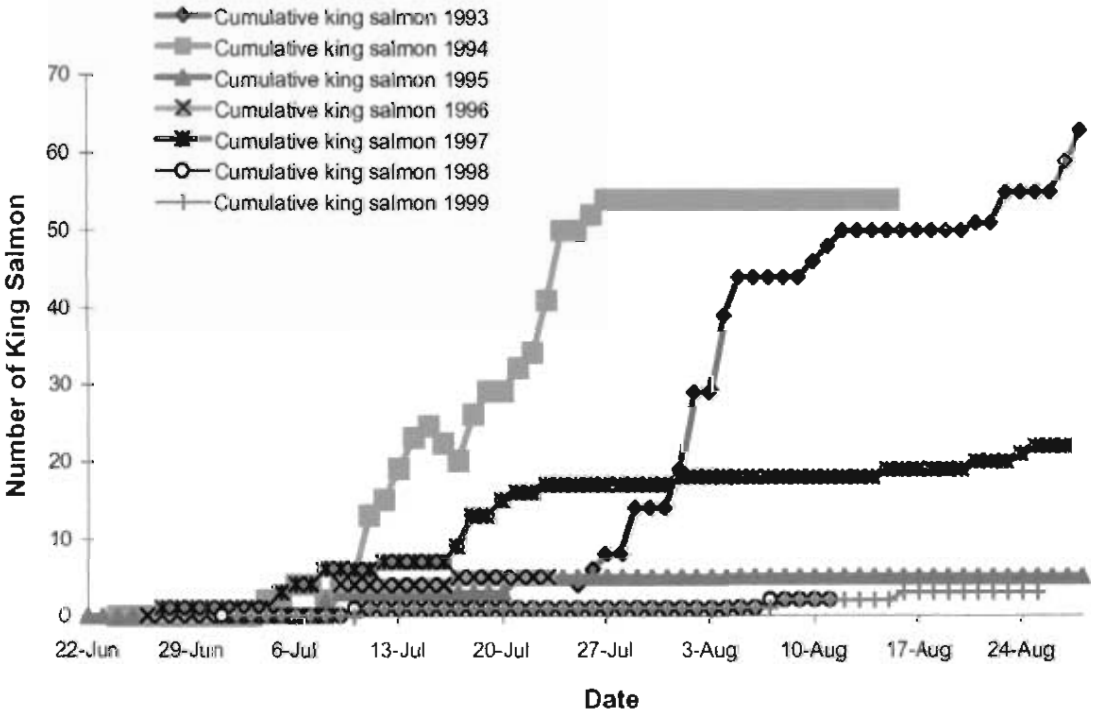

Figure 14. Cumulative coho salmon migration past the Nome River counting tower, 1993-1995, and the Nome River weir, 1996-1999, Norton Sound.

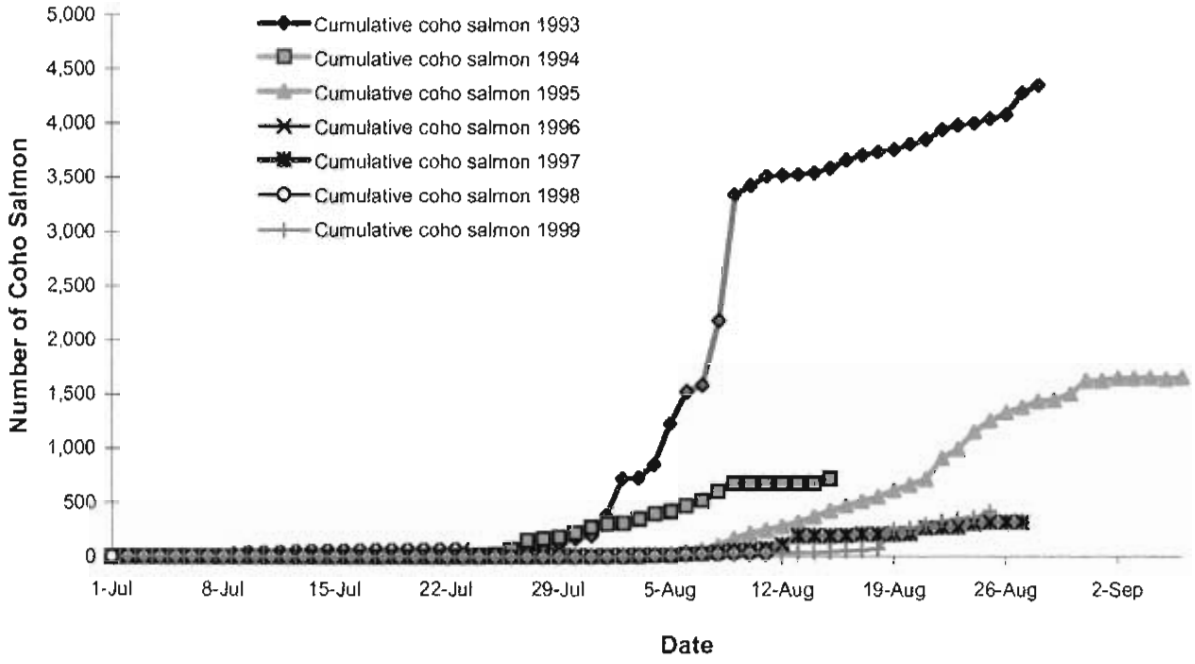

Figure 15. Cumulative Dolly Varden migration past the Nome River counting tower, 1993-1995, and the Nome River weir, 1996-1999, Norton Sound.